X-Plain™
Lung Cancer
Reference Summary

Lung cancer is the most common cancer in adults.

Most cases of lung cancer are related to cigarette smoking. Therefore, if you smoke, it is best to stop smoking as soon as possible.

This reference summary will help you to better understand lung cancer and the treatment options that are available.

Anatomy

Oxygen is vital for life. Without it, death occurs very rapidly. The lungs allow us to fill our blood with oxygen.

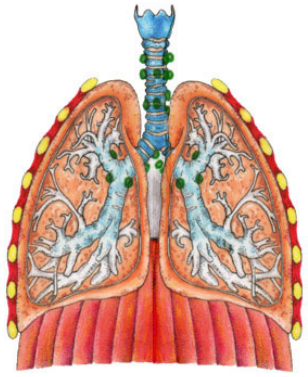
The air we breathe comes in close contact with the blood in the depth of the lungs. The blood then fills up with oxygen and releases unwanted carbon dioxide, CO_2.

When we breathe, the air goes through the mouth and nose.

From there, it goes to the air pipe, known as the trachea.

From the trachea it goes into an increasing number of smaller tubes, called bronchial tubes. Small balloon-like sacs called alveoli are at the end of the tubes.

The walls of the alveoli are very thin. On the other side of the walls small blood vessels exist. The very thin wall of the alveoli allows the oxygen to go into the bloodstream and also allows CO_2 to go from the blood to your lungs to be exhaled.



Muscles surround the bigger bronchial tubes. The inner lining of these bronchial tubes secretes a special substance called mucus. The mucus helps trap dirt from the air. Mucus is continuously expelled from the lungs.

Very small brushes, known as cilia, on the outside of the lung cells continuously push the mucus to the outside. If the mucus becomes sufficiently big, it is coughed out.

Cancer And Its Causes

The body is made up of very small cells. Normal cells in the body grow and die in a controlled way. Sometimes cells keep dividing and growing in an uncontrolled way, causing an abnormal growth called a tumor. If the tumor does not invade nearby tissues and body parts, it is called a benign tumor or non-cancerous growth. Benign tumors are rarely life threatening.

If the tumor does invade and destroy nearby cells, it is called a malignant tumor or cancer. Cancer can be life threatening.

Cancerous cells may also spread to different parts of the body through blood vessels and lymph channels.

Lymph is a nearly clear fluid produced by the body that drains waste from cells. It travels through special vessels and bean-shaped structures called lymph nodes.

Cancer treatments are used to kill or control abnormally growing cancerous cells.

Cancers in the body are given names, depending on where the cancer started. Cancer that begins in the lungs will always be called lung cancer, even if it has spread to another place such as the liver, bones, or brain.

Although doctors can locate where a cancer started, the cause of cancer in a patient cannot usually be identified.

Cells contain hereditary, or genetic, materials called chromosomes. This genetic material controls the growth of the cell.

Cancer tends to run in families, so people with close relatives that have cancer should be examined regularly for any sign of it.

Cancer always develops from changes that occur in the chromosomes. When the genetic material in a cell becomes abnormal, it can lose the ability to control its growth.

Sudden changes in genetic material can occur for a variety of reasons. This tendency may be inherited. Changes in genetic materials may also occur because of exposure to infections, drugs, tobacco, chemicals, or other factors.

Symptoms And Their Causes

There are two main types of lung cancer: non-small cell and small cell. Non-small cell lung cancer is more common, slow growing, and does not spread to other organs rapidly. Small cell lung cancer is not as common. It is fast growing, and spreads very rapidly to other organs.

Cigarette smoking or exposure to second-hand smoke causes the majority of lung cancer cases.

Pipe and cigar smoking increase the risk of lung cancer, although not as severely as cigarette smoking.

Exposure to pollution, radioactive materials, asbestos and other products also increases the chance of developing lung cancer.

Since cell changes that lead to cancer are somewhat reversible, stopping smoking and avoiding exposure to cancer-causing environments improves the chances of not developing lung cancer, even after years of smoking.

Some of the symptoms of lung cancer include the following:

- Cough that does not go away or produces blood
- Hoarseness
- Shortness of breath, chest pain, or wheezing
- Weight loss or loss of appetite

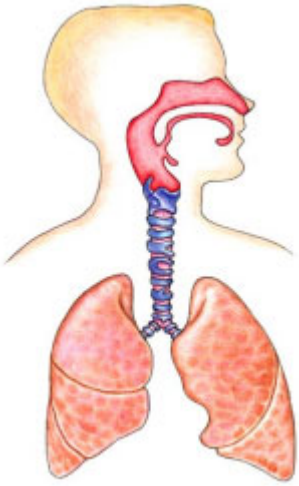
Other symptoms of lung cancer include:

- Swelling in the face or neck
- Repeated lung infections or bronchitis
- Fever
- General weakness - specifically in the shoulder, arm, or hand.

Diagnosis

Chest x-rays are very useful in determining whether there are any abnormalities in the lungs. Abnormal

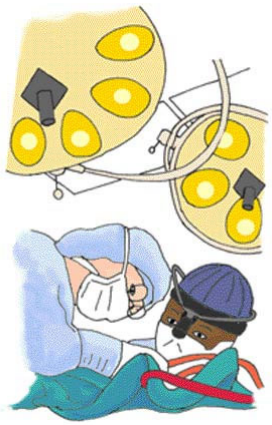
spots found during x-rays are called lesions.



A CAT scan of the lung, a more detailed x-ray of the lungs, helps determine the exact location of any lesions found on a chest x-ray.

A biopsy of the lung lesion is then done. This is a procedure where a small piece of the lesion is taken out to be checked by a pathologist. The pathologist helps determine if the lesion is cancerous or not.

The biopsy can be done one of two ways. One kind of biopsy is to insert a small needle in the lung from the outside of the body, using CAT scan images as a guide. The other way to do a lung biopsy is from the inside of the body, using a scope that the doctor inserts.



If the lesion is found to be cancerous, the oncologist will proceed to check whether the cancer has spread to other parts of the body; this is known as staging. The further a cancer has spread, the higher the stage.

If it appears that the cancer has spread, further tests may be performed to determine exact locations of the cancer. A bone scan, a special radiological exam, may be done to check the bones.

A CAT scan of the abdomen and pelvis may be done.

Head CAT scans or MRIs may also be done.

Blood tests may be necessary to check for anemia, liver, or kidney problems.

Lung lesions may not turn out to be cancerous, however. A lung lesion may indicate an old or new infection in the lungs.

Lung lesions may also indicate benign tumors, as opposed to malignant tumors, which are cancerous. Benign tumors do not have cancer cells in them.

Treatment

The treatment of lung cancer depends on how advanced the cancer is.

If the lung cancer has not spread and is relatively small, surgery may be indicated to take the cancer out.

Radiation therapy and chemotherapy may also be necessary to either try to cure the cancer or at least keep it controlled.

Summary

Lung cancer is not a rare disease. Prevention of lung cancer is the most effective way to fight it. Not smoking is the single most important thing anybody can do to avoid lung cancer.